

**WHAT IS CLAIMED IS:**

Fig. 10

1. A method comprising:
  - identifying, for a packet to be transmitted over a wireless link, a type of
  - 5 service from among at least a first and second type of service;
  - determining an acknowledgement requirement corresponding to the type of service;
  - sending a slot comprising at least a portion of the packet from a sending device to a receiving device;
  - 10 performing, by the receiving device, the acknowledgement requirement corresponding to the type of service, based on an error status of the slot.
2. The method of claim 1, wherein the step of determining an acknowledgement requirement comprises:
  - 15 if the packet is associated with a first type of service, not requiring acknowledgement of the slot by the receiving device; and
  - if the packet is associated with a second type of service, requiring acknowledgement of the slot by the receiving device if the slot is received without error.
- 20 3. The method of claim 2, wherein the first type of service comprises a minimize-delay service and the second type of service comprises a maximize-reliability service.
- 25 4. The method of claim 3, wherein the step of performing the acknowledgement requirement comprises the receiving device:
  - not acknowledging reception of slots associated with minimize-delay service; and
  - acknowledging reception of slots associated with maximize-reliability
  - 30 service, if the slots are received without error.

5. The method of claim 2, wherein the first type of service comprises a minimize-delay service and the second type of service comprises a default service.

6. The method of claim 5, wherein the step of performing the acknowledgment requirement comprises the receiving device:  
not acknowledging reception of slots associated with minimize-delay service; and  
acknowledging reception of slots associated with default service, if the slots are received without error.

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7. The method of claim 1, wherein the step of determining an acknowledgement requirement is accomplished by the sending device, the method further comprising sending, from the sending device to the receiving device, indicia of the acknowledgement requirement.

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8. The method of claim 1, wherein the step of determining an acknowledgement requirement is accomplished by the receiving device.

9. The method of claim 1 comprising, before sending the slot:  
if the packet is associated with a first type of service, encoding the at least a portion of the packet using a error correcting code of a first rate; and  
if the packet is associated with a second type of service, encoding the at least a portion of the packet using a error correcting code of a second rate.

10. The method of claim 9, wherein the error correcting code of the first rate comprises a rate  $\frac{3}{4}$  convolutional code and the error correcting code of the second rate comprises a rate  $\frac{1}{2}$  convolutional code.

11. The method of claim 1 wherein the sending device comprises a repeater and the receiving device comprises a communication unit.

12. The method of claim 1 wherein the sending device comprises a communication unit and the receiving device comprises a repeater.

5 13. A method comprising the steps of:

receiving, by a repeater, a first block of data from a first device;  
determining by the repeater if the first block of data requires  
acknowledgement;

10 if the repeater determines that the first block of data requires  
acknowledgement,

forming by the repeater a time slot including:

indicia of acknowledgement of the first block of data; and

a second block of data targeted for a second device; and

transmitting by the repeater the time slot.

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14. The method of claim 13 wherein the first block of data comprises a portion of a packet and the indicia of acknowledgement comprises an identifier of the packet and an identifier of the portion of the packet.

20 15. The method of claim 13 wherein the time slot further comprises an identification of the first device and an identification of the second device.

16. The method of claim 13 further comprising the steps of:

receiving, by the repeater, a third block of data from a third device;

25 determining by the repeater if the third block of data requires  
acknowledgement;

if the repeater determines that the first and third block of data requires  
acknowledgement, including indicia of acknowledgement of the first and third  
block of data, and the second block of data, in the time slot.

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FIG. 11

17. The method of claim 16 wherein the first block of data comprises a portion of a first packet, the third block of data comprising a portion of a second packet, the indicia of acknowledgement of the first block of data comprising an identifier of the first packet and an identifier of the portion of the first packet and  
5 the indicia of acknowledgement of the third block of data comprising an identifier of the second packet and an identifier of the portion of the second packet.

18. The method of claim 16 wherein the first time slot further comprises an identification of the first device, an identification of the second device and an  
10 identification of the third device.

19. The method of claim 16 wherein the step of receiving, by the repeater, a first block of data comprises the step of receiving, by the repeater on the uplink of a wireless link, a first block of data from a first device; and the step of  
15 receiving, by the repeater, a third block of data comprises the step of receiving, by the repeater on the uplink of a wireless link, a third block of data from a third device.

20. A method comprising the steps of:  
20 receiving, by a communication unit, N blocks of data;  
determining by the communication unit a subset of the N blocks of data that must be acknowledged;  
allocating, by a repeater in communication with the communication unit, an acknowledgement time slot for use by the communication unit;  
25 sending by the communication unit an acknowledgement structure within the allocated acknowledgement time slot.

Fig 13

21. The method of claim 20 wherein the acknowledgement structure includes indicia of acknowledgment for the subset of the N blocks of data.  
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22. The method of claim 20 wherein each of the N blocks of data is a portion of a packet, the acknowledgement structure including identifications of the portion of a packet carried in each of the subset of the N blocks of data.

5           23. The method of claim 20 wherein the step of receiving N blocks of data comprises receiving the N blocks of data within a plurality of time slots.

24. The method of claim 20 wherein the step of determining comprises:  
identifying the subset of the N blocks of data that require  
10 acknowledgement based at least in part on an error status of each of the N blocks of data.

25. The method of claim 20 further comprising:  
receiving, by the repeater, a block of data from the communication unit;  
15 determining by the repeater whether the block of data must be acknowledged; and  
if the repeater determines that the block of data requires acknowledgement,  
forming by the repeater a time slot including:  
20           indicia of acknowledgement of the block of data; and  
a second block of data targeted for a second communication unit; and  
transmitting by the repeater the time slot.

25           26. A method comprising the steps of:  
determining by a sending device that a first communication unit should be assigned a future time slot;  
forming by the sending device a time slot comprising an identification of the first communication unit and data destined for a second communication unit;  
30 and

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sending by the sending device the time slot.

27. The method of claim 26 wherein the time slot further comprises a slot  
type of the future time slot for which it has been determined that the first  
5 communication unit is to be assigned.

28. A slot comprising:

a source identification number field for identifying a sending device;  
a destination identification number field for identifying a receiving device;  
10 a block number field for identifying the segment of a first packet carried in  
the slot;  
a packet number field for identifying the first packet;  
a total number of blocks field for specifying how many segments the first  
packet has been divided into;  
15 a last block length field for specifying the size of the last segment of the  
first packet; and  
one or more blocks of data, each block of data containing a segment of the  
first packet.

29. The slot of claim 28 further comprising:  
one or more blocks of data, each block of data containing a segment of a  
20 second packet.

30. The time slot of claim 28 further comprising:  
25 a next slot communication unit identification number field identifying a  
device that can transmit in a future slot; and  
a slot type field identifying the type of the future slot.

31. The time slot of claim 28 further comprising:

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an acknowledgement identification number field identifying a device for which an acknowledgment message is destined;

an acknowledgment block number field identifying a segment of a second packet that is being acknowledged in the acknowledgment message;

5 an acknowledgment packet number field identifying the second packet;

an acknowledgment bit field specifying whether the acknowledgment identification number field, acknowledgment block number field and acknowledgment packet number field contain valid data; and

10 a confirmation bit field specifying whether a device receiving one of the one or more data blocks should acknowledge error-free reception of the one of the one or more data blocks.

32. A method comprising the steps of:

receiving by a sending device a first packet having a first priority level;

15 splitting by the sending device the first packet into segments that can be transported within data blocks of a time slot;

commencing transmission by the sending device of a time slot comprising a plurality of data blocks, at least one of the data blocks containing a segment of the first packet;

20 receiving by the sending device after commencement of transmission of the time slot a second packet having a second priority level, the second priority level higher than the first priority level;

splitting by the sending device the second packet into segments that can be transported within data blocks of a time slot;

25 continuing transmission of the time slot with one or more data blocks containing a segment of the second packet.

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